THE UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application of	
Inventors: Simon RICHES et al.	: Confirmation No. 8329
	:
U.S. Patent Application No. 09/955,223	: Group Art Unit: 2131
	:
Filed: September 19, 2001	: Examiner: Longbit Chai
For: DATA PROTECTION	

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Attn: BOARD OF PATENT APPEALS AND INTERFERENCES

BRIEF ON APPEAL

This brief is in furtherance of the Notice of Appeal, filed in this case on October 15, 2007.

The fees required under § 1.17(f) and any required petition for extension of time for filing this brief and fees therefore, are dealt with in the accompanying TRANSMITTAL OF APPEAL BRIEF.

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I. Real Party in Interest

The real party in interest is Hewlett-Packard Development Company, L.P., a Texas limited partnership.

II. Related Appeals and Interferences

There are no other appeals or interferences that will directly affect, or be directly affected by, or have a bearing on the Board's decision in this appeal.

III. Status of Claims

A. Total Number of Claims in Application

There is a total of 39 claims in the application, which are identified as claims 90-98, 100-108, 110-117, and 119-131.

B. Status of all the Claims

Claims 90-98, 100-108, 110-117, and 119-131 are pending.

Claims 90-98, 100-108, 110-117, and 119-128 are rejected.

Claims 1-89, 99, 109, and 118 are cancelled.

C. Claims on Appeal

The Final Official Action (FOA) mailed on August 15, 2007 incorrectly indicated claims 90-98, 100-108, 110-117, and 119-128 as pending in the application. Appellants are unable to determine the PTO's intention with respect to claims 129-131, however, in the absence of any art-based rejections Appellants assume that the claims are allowable notwithstanding any indication of allowability in the FOA. If Appellants are incorrect, the PTO is requested to clarify and articulate an appropriate rationale. Based on the foregoing, Appellants believe that the claims on appeal are claims 90-98, 100-108, 110-117, and 119-128. As indicated herein, claims 129-131 are patentable over the references applied to claims 90-98, 100-108, 110-117, and 119-128 for at

least reasons similar to those advanced with respect to claims 90-98, 100-108, 110-117, and 119-128 herein.

IV. Status of Amendments

There are no outstanding un-entered amendments before the Examiner.

V. Summary of Claimed Subject Matter

The present invention relates generally to protecting data recorded on a data storage tape.

Claim 90

Independent claim 90 recites a method of recording data during successive data recording sessions on a data storage tape of a tape cartridge loaded in a tape drive, the sessions occurring at different times, the method comprising recording data in each recording session by:

positioning the tape prior to the start of the data recording session so the tape is positioned to a start point at the start of a data set to be recorded during the session (Instant specification in at least paragraph 100, and FIG. 5, step 22);

after the session has started and during the data recording session, writing the data set to the tape (Instant specification in at least paragraph 101, and FIG. 5, step 24);

after the data set has been written to the tape, issuing a reposition command to the tape drive so the tape is repositioned (Instant specification in at least paragraph 102, and FIG. 5, step 26);

creating a code representative of the data in the data set that has been written during the recording session between the position command and the reposition command (Instant specification in at least paragraphs 101-103, and FIG. 5, step 24);

after the tape drive receives the reposition command, writing the code into a memory incorporated within the tape cartridge (Instant specification in at least paragraph 102, and FIG. 5, step 26);

in response to the code being written into the memory, incrementing a code counter indicating a count of the number of codes written into the memory (Instant specification in at least paragraph 104, and FIG. 5, step 26); and

writing the count into a count field of the memory (Instant specification in at least paragraph 104, and FIG. 5, step 26).

Claim 110

Independent claim 110 recites an apparatus for recording data during successive data recording sessions occurring at different times, on a data storage tape of a tape cartridge, the apparatus comprising:

a tape drive arranged to receive the tape cartridge (Instant specification in at least paragraph (Instant specification in at least paragraph 82, and FIG. 1, element 2);

means for issuing a position command to the tape drive (Instant specification in at least paragraph 83, and FIG. 1, element 7);

means for causing the data recording session to start after the tape drive has been positioned to a start of a data set to be recorded during the session in response to the issued command (Instant specification in at least paragraphs 83 and 100, and FIG. 1, elements 7 and 8);

means for writing the data set to the tape after the data recording session has started and during the data recording session (Instant specification in at least paragraphs 83 and 101, and FIG. 1, elements 7 and 8);

means for issuing a reposition command to the tape drive for causing the tape to be repositioned after the data set has been written to the tape (Instant specification in at least paragraphs 83 and 102, and FIG. 1, elements 7 and 8);

means for creating a code representative of the data in the data set that has been written during the recording session between the position command and the reposition command (Instant specification in at least paragraphs 101-103, and FIG. 1, elements 8 and 2);

means for writing the code into a memory incorporated within the tape cartridge after the tape is repositioned (Instant specification in at least paragraph 102, and FIG. 1, element 2);

means connected to be responsive to the code being written into the memory for incrementing a code counter for indicating a count of the number of codes written into the memory (Instant specification in at least paragraphs 86 and 104, and FIG. 1, element 2); and

means for writing the count into a count field of the memory (Instant specification in at least paragraphs 86 and 104, and FIG. 1, element 2).

Claim 130

Independent claim 130 recites a method of protecting data recorded on a data storage tape, the data recorded during successive sessions on the data storage tape, the method comprising:

generating a code representative of tamper-free data in a data set written during a session (Instant specification in at least paragraphs 101-103, and FIG. 1, 5, step 24); and

recording the code in a dedicated portion of the tape cartridge set aside from the data set (Instant specification in at least paragraph 102, and FIG. 5, step 26).

Claim 131

Independent claim 131 recites a method of recording data during successive data recording sessions on a data storage tape of a tape cartridge loaded in a tape drive, the sessions occurring at different times, the method comprising recording data in each recording session by:

positioning the tape prior to the start of the data recording session so the tape is positioned to a start point at the start of a data set to be recorded during the session (Instant specification in at least paragraph 100, and FIG. 5, step 22);

after the session has started and during the data recording session, writing the data set to the tape (Instant specification in at least paragraph 101, and FIG. 5, step 24);

after the data set has been written to the tape, issuing a reposition command to the tape drive so the tape is repositioned (Instant specification in at least paragraph 102, and FIG. 5, step 26);

creating a code representative of the data in the data set that has been written during the recording session between the position command and the reposition command (Instant specification in at least paragraphs 101-103, and FIG. 5, step 24);

writing the code into a memory incorporated within the tape cartridge, wherein the memory comprises a cartridge memory that differs from the tape (Instant specification in at least paragraph 102, and FIG. 5, step 26);

in response to the code being written into the memory, incrementing a code counter indicating a count of the number of codes written into the memory (Instant specification in at least paragraph 104, and FIG. 5, step 26); and

writing the count into a count field of the memory (Instant specification in at least paragraph 104, and FIG. 5, step 26).

VI. Grounds of Rejection to be Reviewed on Appeal

A. The issue is whether claims 90, 92, 94-97, 101, 103, 105-107, 110, 112, 114-116, and 124-128 are unpatentable under 35 U.S.C 103(a) as being obvious over Johnston et al. (US 5,287,478).

B. The issue is whether claims 93, 104, and 113 are unpatentable under 35 U.S.C 103(a) as being obvious over Johnston in view of Maekawa et al. (US 6,160,679).

C. The issue is whether claims 98-100, 108-109, 117-118, and 120-123 are unpatentable under 35 U.S.C 103(a) as being obvious over Johnston in view of Shnelvar (US 6,374,266).

D. The issue is whether claim 119 is unpatentable under 35 U.S.C 103(a) as being obvious over Johnston in view of Ishiguro (US 4,788,641).

VII. Argument

A. Was the PTO correct in rejecting claims 90, 92, 94-97, 101, 103, 105-107, 110, 112, 114-116, and 124-128 under 35 U.S.C. 103(a) as being obvious over Johnston?

The rejection of claims 90, 92, 94-97, 101, 103, 105-107, 110, 112, 114-116, and 124-128 under 35 U.S.C. 103(a) as being unpatentable in view of Johnston is hereby traversed for the following reasons.

Claim 90

Reply to the PTO Interview Summary

Appellants reply to the PTO's assertions set forth in the Interview Summary of September 6, 2007 as follows.

First, Appellants pointed out to the Examiner during the interview that Johnston does not teach that the code written to memory is based on data read back from tape.

Second, the Examiner's description of Johnston appears to buttress Appellants' position, i.e., that Johnston fails to disclose or suggest the present claimed subject matter comprising writing a code, representative of the data in a data set after a tape drive receives a position command. The Examiner states, "Johns[t]on teaches if the error is not minimal, the frame is rewritten and for the data integrity purpose it is obvious (well known) to keep the new checksum written as being corresponding to the newly corrected data being written to the tape." Interview Summary. First, the Examiner has failed to set forth any evidence regarding the assertion of obviousness or whether the assertion is "well known." The Examiner is requested to properly support the assertion of obviousness and "well known" in any response. Second, the

Examiner has failed to identify how the asserted portion of Johnston meets the claimed feature of writing a code, representative of data written in a data set, after receiving a reposition command. Assuming *arguendo* that the Examiner is correct, the Examiner's states that Johnston rewrites a frame and corresponding checksum without identifying that the checksum is written after a reposition command. For at least this reason, reversal of the rejection is respectfully requested.

Third, the Examiner failed to note that Appellants pointed out that Johnston fails to disclose or suggest writing a checksum representative of the data written after receiving a reposition command. That is, the Examiner was unable to identify a teaching in Johnston of writing the checksum after receiving a reposition command where the checksum is representative of the data written. For at least this reason, reversal of the rejection is respectfully requested.

Reply to the PTO Response to Arguments section of the Final Official Action

Appellants reply to the PTO's Response to Arguments as set forth in the Final Official Action (FOA) at pages 2 and 3.

First, the PTO states that "in order to read-back the data that was just written into the tape for calculating the checksum/parity, the tape must be repositioned back at the original starting point of the data set." Assuming *arguendo* this is correct, the PTO misses the point that Johnston fails to disclose or suggest writing a code, representative of the data written, after repositioning the tape "back at the original starting point of the data set." For at least this reason, reversal of the rejection is respectfully requested.

Further, Johnston fails to disclose or suggest writing a code, representative of the data in a data set that has been written during a recording session, into a memory incorporated within a tape cartridge after a tape drive receives a position command as claimed in the present claimed subject matter. The PTO asserts that Johnston teaches "writing to tape in a way that the data from the track was just written is read-back and its checksum is calculated (Johnston: Column 10 Line 50-53) and then the checksum (i.e. the code) along with the block ID are also written to the memory of the tape (Johnston: Column 11 Line 18-21)." Final Official Action at page 2, lines 13-16. The PTO appears to be incorrectly reading Johnston. The identified portion and two additional lines (column 10, lines 50-56) of Johnston are reproduced herein for convenience and ease of reference:

> RAW [read after write] is performed only when writing to tape. **A track that was just written is read and its C1 ECC syndromes and checksum is calculated to verify that the track has been properly written.** For C1 ECC, in memory, for each block of the track being read, there is stored any non-zero syndromes plus the block number. . . . **If the number of bad blocks and the severity of the error is minimal, the frame is not rewritten**.
>
> (emphasis added)

The identified portion of Johnston appears to describe a read of a track being performed after a write of a track in order to calculate C1 ECC syndromes and a checksum. Johnston fails to disclose writing the calculated syndromes or checksum to the tape cartridge. The memory referred to in the identified portion of Johnston appears to be either the "large internal memory" of the microcontroller 305 (see, column 6, lines 64-66), the frame buffer 417 (see, column 29, lines 25-32), or the data buffer (see, column 30, lines 4-13). None of these memories meet the claim limitation

of being a memory incorporated within the tape cartridge. For at least this reason, reversal of the rejection is respectfully requested.

Column 11, lines 18-21 is not dispositive as the identified portion refers to subcode data and block IDs written to the tape as part of a track being written to tape and not writing a code representative of data in a data set written during a recording session after receipt of a reposition command after the data set has been written to tape. The entirety of the section comprising the identified portion appears to refer to the overall data flow for arranging data in main buffer 404 and frame buffer 417 prior to writing a track to tape, during which "C1 ECC parity is appended to each track's data block pairs." Johnston at column 11, lines 20-21. That is, Johnston's parity information appears to be written as part of a recording session and the identified portion appears to refer to writing to the buffers and not to the tape cartridge. This bit of obfuscation by the PTO misleads the reader by not identifying that the checksum/parity which is calculated is not the same checksum/parity which is written to the tape. For at least this reason, reversal of the rejection is respectfully requested.

Further, the read after write process appears to read a track being written in order to determine whether the track needs to be written again, see, "If the severity of the error is minimal, the frame is not rewritten." That is, RAW performs a read after a write. A rewrite of a track occurs after a RAW determination that there is an error, there is no disclosure of writing a code after or as part of the RAW process described in Johnston. For at least this reason, reversal of the rejection is respectfully requested.

Second, the PTO asserts without support that "the corrected RAW checksum must be **obviously** written, in stead of the original checksum/parity that was supposed to be written . . . so that the data integrity . . . can be validated later on the next data check since the checksum/parity is used for verifying the previously written corrected data." FOA at page 3, lines 4-8 (emphasis in original). This is incorrect and wholly unsupported by the plain language of Johnston.

As set forth above, Johnston appears to describe rewriting the track (including checksum) if the severity of an error determined after RAW is more than minimal. There is no disclosure, nor has the PTO identified any disclosure, in Johnston of repositioning the tape drive to write the corrected RAW checksum in place of the original checksum apart from rewriting the entirety of the track. For at least this reason, reversal of the rejection is respectfully requested.

Further, the PTO asserts that the corrected RAW checksum must be obviously" written without either identifying support in the reference or providing an articulated reasonable rationale for the assertion. The PTO is respectfully requested to set forth a proper case of obviousness prior to asserting obviousness. Further still, the assertion is contrary to the explicit language of Johnston, as set forth above. For either of these reasons, reversal of the rejection is respectfully requested.

Based on the foregoing, claim 90 is patentable over Johnston and reversal of the rejection is respectfully requested.

Claims 92, 94-97, 101, 103, and 105-107 depend, either directly or indirectly, from claim 90, include further limitations, and are patentable over Johnston for at least

the reasons advanced above with respect to claim 90. The rejection of claims 92, 94-97, 101, 103, and 105-107 should be reversed.

Claim 110 is patentable over Johnston for at least reasons similar to those advanced above with respect to claim 90 and reversal of the rejection is respectfully requested.

Claims 112, 114-116, and 124-128 depend, either directly or indirectly, from claim 110, include further limitations, and are patentable over Johnston for at least the reasons advanced above with respect to claim 110. The rejection of claims 112, 114-116, and 124-128 should be reversed.

B. Was the PTO correct in rejecting claims 93, 104, and 113 under 35 U.S.C. 103(a) as being obvious over Johnston in view of Maekawa?

Claim 93

The rejection of claims 93, 104, and 113 under 35 U.S.C. 103(a) as being unpatentable over Johnston in view of Maekawa is hereby traversed in view of at least the foregoing reasons advanced above with respect to claim 90. Claim 93 is also patentable over Johnston in view of Maekawa for at least the following reason.

The PTO asserts that a person of ordinary skill in the art at the time of the present invention would have been motivated to combine Johnston with Maekawa in order to resolve "problems of limitation in size as well as the security concerns of the discrimination information." Final Official Action at page 8, lines 13-17. The PTO has failed to explain how a person of ordinary skill in the art would combine Johnston with Maekawa as asserted to arrive at the claimed subject matter. Maekawa appears to be concerned with applying tape specification discrimination information to a tape cartridge to prevent having to "load corresponding cartridge into the recording and/or reproducing unit to carry out reproducing operation every time to confirm the labeling on the tape cartridge. Maekawa at column 3, lines 37-39. Further, Maekawa specifically states that the tape cartridge referred to, i.e., as disclosed in the referred to Japanese Patent Application, includes an auxiliary memory element so that discrimination information is stored therein. That is, Maekawa appears to describe storing discrimination information usable to discern a tape type.

The "problems of limitation in size" of Maekawa refer to the label size on a tape cartridge for placing "information of the specification of the magnetic tape 7 and/or

right or wrong state of recording of information signal by the holes provided at the cartridge body 4." Maekawa at column 3, lines 15-18. Further still, see Maekawa at column 10, lines 27-39, referring to the difficulties associated with a label on the tape cartridge, e.g., "in which the content described is unable to be read as the result of the fact that the label is separated (peeled) off or is soiled." The security concerns also refer to labeling issues and not code representative of data in a data set written during a recording session, e.g., "where information signals which require secrecy are recorded, it is impossible to describe its content on the label."

The PTO has failed to identify any teaching or suggestion in Maekawa or Johnston of writing a code as described above into such an auxiliary memory unit of a tape cartridge. Johnston appears to describe storing checksum information during the course of writing frames of information to tape and not writing such information remote from the written frames, much less from the tape on which the frames are recorded. As described above, Maekawa fails to disclose writing a code representative of data in a data set that has been written during a record session as claimed. Applicants fail to understand how a combination of Johnston and Maekawa would lead a person of ordinary skill in the art at the time of the present invention to store the checksum, i.e., asserted by the PTO to correspond to the claimed code representative of the data, of Johnston in the tape type discriminating information of Maekawa. Put another way, the combination of Johnston in view of Maekawa improves the tape labeling capability of Johnston without disclosing or suggesting the storage, into a memory within a tape cartridge, of a code representative of data in a data set written during a recording session.

Based on at least the foregoing, claim 93 is patentable over Johnston in view of Maekawa and a Notice of Allowance is courteously solicited.

Claims 104 and 113 are patentable over Johnston in view of Maekawa for at least reasons similar to those advanced above with respect to claim 93 and a Notice of Allowance is courteously solicited.

Since claims 90 and 110 include limitations not disclosed or made obvious by Johnston et al., and the remaining claims depend on claims 90 and 110, and the secondary references do not cure the deficiencies in Johnston et al., a Notice of Allowance of claims 90-92, 94-98, 100-108, 110-112, 114-117, and 119-131 is believed to be in order and is courteously solicited.

C. Was the PTO correct in rejecting claims 98-100, 108-109, 117, and 120-123 under 35 U.S.C. 103(a) as being obvious over Johnston in view of Shnelvar?

The rejection of claims 98-100, 108-109, 117-118, and 120-123 as being unpatentable over Johnston in view of Shnelvar is hereby traversed for at least the foregoing reasons advanced above with respect to claims 90 and 110. Shnelvar fails to cure the above-noted deficiencies of Johnston and reversal of the rejection is respectfully requested.

D. Was the PTO correct in rejecting claim 119 under 35 U.S.C. 103(a) as being obvious over Johnston in view of Ishiguro?

The rejection of claim 119 as being unpatentable over Johnston in view of Ishiguro is hereby traversed for at least the foregoing reasons advanced above with respect to claims 90 and 110. Ishiguro fails to cure the above-noted deficiencies of Johnston and reversal of the rejection is respectfully requested.

VIII. Conclusion

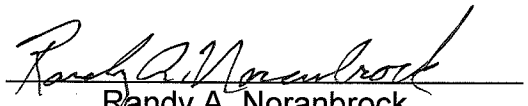
Each of the PTO's rejections has been traversed. Appellant respectfully submits that all claims on appeal are considered patentable over the applied art of record. Accordingly, reversal of the PTO's Final Rejection is believed appropriate and courteously solicited.

If for any reason this Appeal Brief is found to be incomplete, or if at any time it appears that a telephone conference with counsel would help advance prosecution, please telephone the undersigned, Appellant's attorney of record.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 08-2025 and please credit any excess fees to such deposit account.

Reversal of the rejection is in order.

Respectfully submitted,
Simon RICHES et al.

By: 

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IX. Claims Appendix

90. A method of recording data during successive data recording sessions on a data storage tape of a tape cartridge loaded in a tape drive, the sessions occurring at different times, the method comprising recording data in each recording session by:

positioning the tape prior to the start of the data recording session so the tape is positioned to a start point at the start of a data set to be recorded during the session;

after the session has started and during the data recording session, writing the data set to the tape;

after the data set has been written to the tape, issuing a reposition command to the tape drive so the tape is repositioned;

creating a code representative of the data in the data set that has been written during the recording session between the position command and the reposition command;

after the tape drive receives the reposition command, writing the code into a memory incorporated within the tape cartridge;

in response to the code being written into the memory, incrementing a code counter indicating a count of the number of codes written into the memory; and

writing the count into a count field of the memory.

91. A method according to claim **90**, wherein the code includes a signature.

92. A method according to claim **91** wherein the signature is coded to include a checksum or a cyclic redundancy check (CRC).

93. A method according to claim **90**, wherein the memory includes a cartridge memory that differs from the tape.

94. A method according to claim **90**, wherein the memory includes a dedicated area of the tape.

95. A method as claimed in claim **90**, further including the steps of:

reading back a data set from the tape;

creating a further code representative of the data in the data set read back from the tape;

comparing the two codes; and

confirming the data set as valid only if the two codes agree.

96. A method according to claim **95**, wherein the comparing and confirming steps are carried out by a controlling software application.

97. A method according to claim **95**, wherein at least one of the comparing and confirming steps is carried out by an external reader which accesses and displays information recorded in the memory.

98. A method according to claim **90**, further including the steps of checking whether the number of codes written into the memory has reached a predetermined number and, if so, reporting the tape as read only.

100. A method according to claim **90**, further including the step of comparing the codes and number of entries against information held on a secure database.

101. Apparatus for recording data during successive data recording sessions occurring at different times, on a data storage tape of a tape cartridge, the apparatus comprising:

a tape drive to receive the tape cartridge, and a processor having software to control the tape drive to record data in each recording session by performing the steps of claim **90**.

102. Apparatus according to claim **101**, wherein the code includes a signature.

103. Apparatus according to claim **101** wherein the signature is coded to a checksum or a cyclic redundancy check (CRC).

104. Apparatus according to claim **101**, wherein the memory includes a cartridge memory.

105. Apparatus according to claim **101**, wherein the memory includes a dedicated area of the tape.

106. Apparatus as claimed in claim **101**, wherein the processor is arranged to read back a data set from the tape, create a further code representative of the data in the data set read back from the tape, compare the two codes, and confirm the data set as valid only if the two codes agree.

107. Apparatus according to claim **106**, comprising an external reader for accessing and displaying information recorded in the memory.

108. Apparatus according to claim **101**, wherein the processor is arranged to check whether the number of codes written into the memory has reached a predetermined number and, if so, to report the tape as read only.

110. Apparatus for recording data during successive data recording sessions occurring at different times, on a data storage tape of a tape cartridge, the apparatus comprising:

a tape drive arranged to receive the tape cartridge;

means for issuing a position command to the tape drive;

means for causing the data recording session to start after the tape drive has been positioned to a start of a data set to be recorded during the session in response to the issued command;

means for writing the data set to the tape after the data recording session has started and during the data recording session;

means for issuing a reposition command to the tape drive for causing the tape to be repositioned after the data set has been written to the tape;

means for creating a code representative of the data in the data set that has been written during the recording session between the position command and the reposition command;

means for writing the code into a memory incorporated within the tape cartridge after the tape is repositioned;

means connected to be responsive to the code being written into the memory for incrementing a code counter for indicating a count of the number of codes written into the memory; and

means for writing the count into a count field of the memory.

111. Apparatus according to claim **110**, wherein the code includes a signature.

112. Apparatus according to claim **110**, wherein the signature is coded to include a checksum or a cyclic redundancy check (CRC).

113. Apparatus according to claim **110**, wherein the memory includes a cartridge memory that differs from the tape.

114. Apparatus according to claim **110**, wherein the memory includes a dedicated area of the tape.

115. Apparatus according to claim **110**, further comprising means to read back a data set from the tape, means to create a further code representative of the data in the data set read back from the tape, means to compare the two codes, and means to confirm the data set as valid only if the two codes agree.

116. Apparatus according to claim **110**, further comprising means to access and display information recorded in the memory.

117. Apparatus according to claim **110**, further comprising means to check whether the number of codes written into the memory has reached a predetermined number and, if so, to report the tape as read only.

119. Apparatus according to claim **101**, wherein the processor software includes an erase command for erasing both the data on the tape and the contents of the memory.

120. The method of claim **90**, wherein the method is performed to backup data of a computer to the data storage tape so that the data set written to the tape is the set of data of the computer being backed up and the created code is indicative of the backed up data.

121. The method of claim **90**, wherein the memory includes an area for storing several codes corresponding with data sets written to the tape, the method further comprising: writing, into different portions of the area, different codes corresponding with each different data set written into the tape as a result of writing the different data sets into the tape; performing a restoration or validation operation of a data set on a tape of a tape cartridge loaded in the drive; the restoration or validation operation including: (a) causing the tape drive to comply with a request to report the code of a data set required to be restored or validated by reading the requested code from the portion of the memory area where the code for the data set required to be restored or validated is located; (b) positioning the tape to the start of the data set to be restored or validated; (c) then reading the data set to be restored or validated back from the tape; (d) generating a new code corresponding with the data set read during (c), the new code being generated externally of the memory; and (e) after completion of step (c), comparing the new code generated during (d) with the code read during (a) to determine if the data set read during (c) is valid or invalid.

122. The apparatus of claim **110**, wherein the memory includes an area for storing several codes corresponding with data sets written to the tape, the drive being arranged for: (A) writing, into different portions of the area, different codes corresponding with each different data set written into the tape as a result of writing the different data sets into the tape; (B) performing a restoration or validation operation of a data set on a tape of a tape cartridge loaded in the drive; the restoration or validation operation including: (a) causing the tape drive to comply with a request to

report the code of a data set required to be restored or validated by reading the requested code from the portion of the memory area where the code for the data set required to be restored or validated is located; (b) positioning the tape to the start of the data set to be restored or validated; (c) then reading the data set to be restored or validated back from the tape; a processor arrangement for (i) generating a new code corresponding with the data set read during (c), the new code being generated externally of the memory; and (ii) after completion of step (c), comparing the new code generated during (i) with the code read during (a) to determine if the data set read during (c) is valid or invalid.

123. The apparatus of claim **122**, wherein the tape drive includes the processor arrangement for (i) generating the new code.

124. The method of claim **91** wherein one of the recording sessions is for backing up data, and performing the following steps during the session:

preventing rewriting of a signature by limiting access to the memory to allow only (a) retrieval of signatures, and (b) creating of a new signature at a previously unused counter location.

125. The method of claim **124**, wherein the signature is written to the next free slot of the memory at the same time that the signature count is incremented in the code counter.

126. The method of claim **95**, wherein the steps recited in claim 95 are performed in connection with a recording session during which data are restored.

127. The apparatus of claim **106**, wherein the processor is arranged to perform the steps of claim 106 in connection with a recording session during which data are restored.

128. The apparatus of claim **115**, wherein the means recited in claim 115 are arranged to be activated in connection with a recording session during which data are restored.

129. The method of claim **90**, wherein writing the code comprises repositioning the tape prior to writing the code into the memory.

130. A method of protecting data recorded on a data storage tape, the data recorded during successive sessions on the data storage tape, the method comprising:

generating a code representative of tamper-free data in a data set written during a session; and

recording the code in a dedicated portion of the tape cartridge set aside from the data set.

131. A method of recording data during successive data recording sessions on a data storage tape of a tape cartridge loaded in a tape drive, the sessions occurring at different times, the method comprising recording data in each recording session by:

positioning the tape prior to the start of the data recording session so the tape is positioned to a start point at the start of a data set to be recorded during the session;

after the session has started and during the data recording session, writing the data set to the tape;

after the data set has been written to the tape, issuing a reposition command to the tape drive so the tape is repositioned;

creating a code representative of the data in the data set that has been written during the recording session between the position command and the reposition command;

writing the code into a memory incorporated within the tape cartridge, wherein the memory comprises a cartridge memory that differs from the tape;

in response to the code being written into the memory, incrementing a code counter indicating a count of the number of codes written into the memory; and

writing the count into a count field of the memory.

X. Evidence Appendix

None.

XI. Related Proceedings Appendix

None.